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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/545,834	04/10/2000	Shuhie Harada	Q58793	3167

7590 05/22/2002

Sughrue Mion Zinn Macpeak & Seas
2100 Pennsylvania Avenue NW
Washington, DC 20037-3202

EXAMINER

TRAN, LY T

ART UNIT

PAPER NUMBER

2853

DATE MAILED: 05/22/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/545,834

Applicant(s)

HARADA ET AL.

Examiner

Ly T TRAN

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 March 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,4,5,33-41 and 66-74 is/are pending in the application.
- 4a) Of the above claim(s) 2,3,6-32 and 42-65 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,4,5,33-37,41 and 66-74 is/are rejected.
- 7) ☒ Claim(s) 38-40 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of species in Paper No. 11 is acknowledged.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 4-5 and 66-74 are rejected under 35 U.S.C. 103(a) as being unpatentable over Terasawa et al. (USPN 5,126,766) in view of Terasawa (USPN 5,086,305).

With respect to claims 1, 5 and 66 and 69, Terasawa et al. discloses an apparatus and a method of:

- An ink jet recording head having nozzle orifices from which ink drops are ejected (Column 4: line 24-25);
- An ink storage unit for storing ink to be supplied to the recording head (Column 4: line 22-24);

- An ink flow passage communicating the ink storage unit and the recording head (Fig.1: element 60);
- A valve unit for opening/closing the ink flow passage ((Fig.1: element 52);
- A capping unit for sealing the nozzle orifices (Fig.1: element 21) provided with an air hole communicating with the atmosphere (Fig.1 element 20);
- An air valve for opening/closing the air hole (Fig.1: element 20)
- A suction pump for reducing pressure (Fig.1: element 20);
- A control unit for controlling the valve unit, the capping unit and the suction pump unit (Fig1: element 56) such that: the valve unit closes the ink flow passage, the capping unit seals the nozzle orifice, the suction pump decompresses the internal space of the capping unit and the valve unit opens the ink flow passage a predetermined time period elapses (Column 6: line 3-19, Fig. 8E);
- The suction pump decompresses the internal space of the capping unit under a condition that the valve unit closes the ink flow passage and the capping unit seals the nozzle orifice (Fig.8B-8D: shows at the first operation pump, the cap and the supply path are closed)

- The capping unit such that the decompresses state of the internal space of the capping unit is maintained while the suction pump is driven (Fig.6D-6E)
- The suction pump continues decompressing the internal space of the capping unit for a second predetermined time period (Fig.6C+6D);

With respect to claims 4 and 68, Terasawa et al. discloses an apparatus and a method of wherein the predetermined time period is defined as either a time period required for obtaining a satisfactory deaeration degree of ink between the valve unit and the nozzle orifice (Column 2: line 3-10, Fig. 6A-6H, Fig 8A-8J).

With respect to claims 67 and 70, Terasawa et al. discloses a control method wherein the sealing step and the closing step are executed synchronously (Column 6: line 3-6).

With respect to claim 71, Terasawa et al. discloses the step of stopping to drive the suction pump after a second predetermined time period has elapsed since the ink flow passage was opened (Fig.6C-6D).

With respect to claim 72, Terasawa et al. discloses the step of driving the suction pump between the sealing step and the closing step (Fig.6C-6E).

With respect to claim 73, Terasawa et al. discloses the step of driving the suction pump again after the stopping step has executed (Fig.6D).

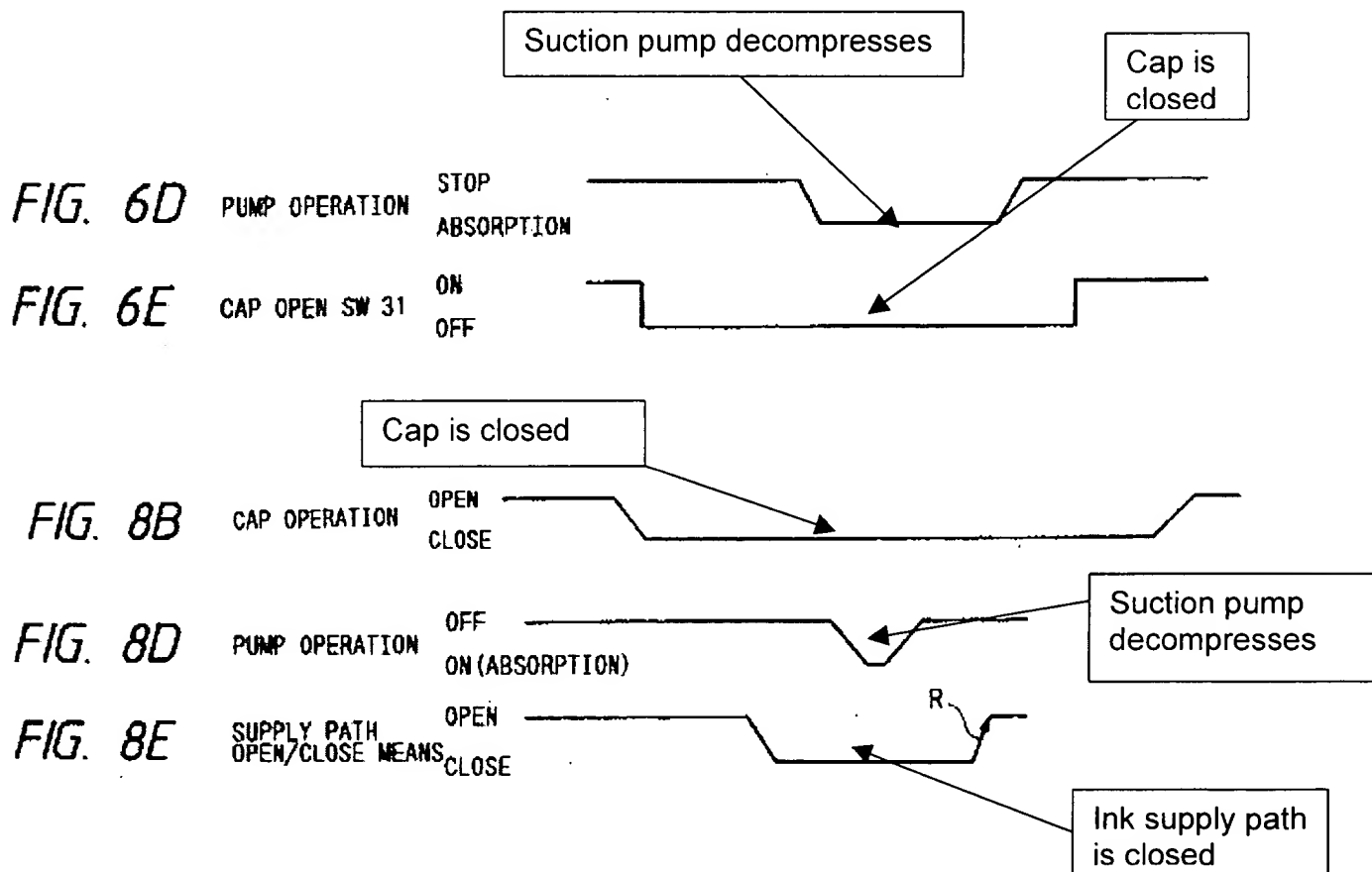
With respect to claim 74, Terasawa et al. discloses step of releasing the capping unit from the nozzle orifices after the suction pump has driven again and driving the

suction pump again to discharge ink from the nozzle orifices in a capping released state (Fig.6D-6E).

However, Terasawa et al. fail to teach the air valve always closes the air hole while the suction pump decompresses the internal space of the capping unit.

Terasawa teaches the air valve always closes the air hole while the suction pump decompresses the internal space of the capping unit (Fig.9C-9D).

It would have been obvious to one having ordinary skill in the art at the time the invention was made with air valve always closes the air hole while the suction pump decompresses the internal space of the capping unit as taught by Terasawa. The motivation of doing so is in order to maintain and increase the internal pressure so the ink can be suck out by the pump.



3. Claims 33-37 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Terasawa et al. (USPN 5,126,766) in view of Terasawa (USPN 5,086,305) as applied to claims 1, 4-5 and 66-74 above, further in view of Wu et al. (USPN 5,851,004).

The combination of Terasawa et al. and Terasawa teaches an apparatus of a valve unit for opening/closing.

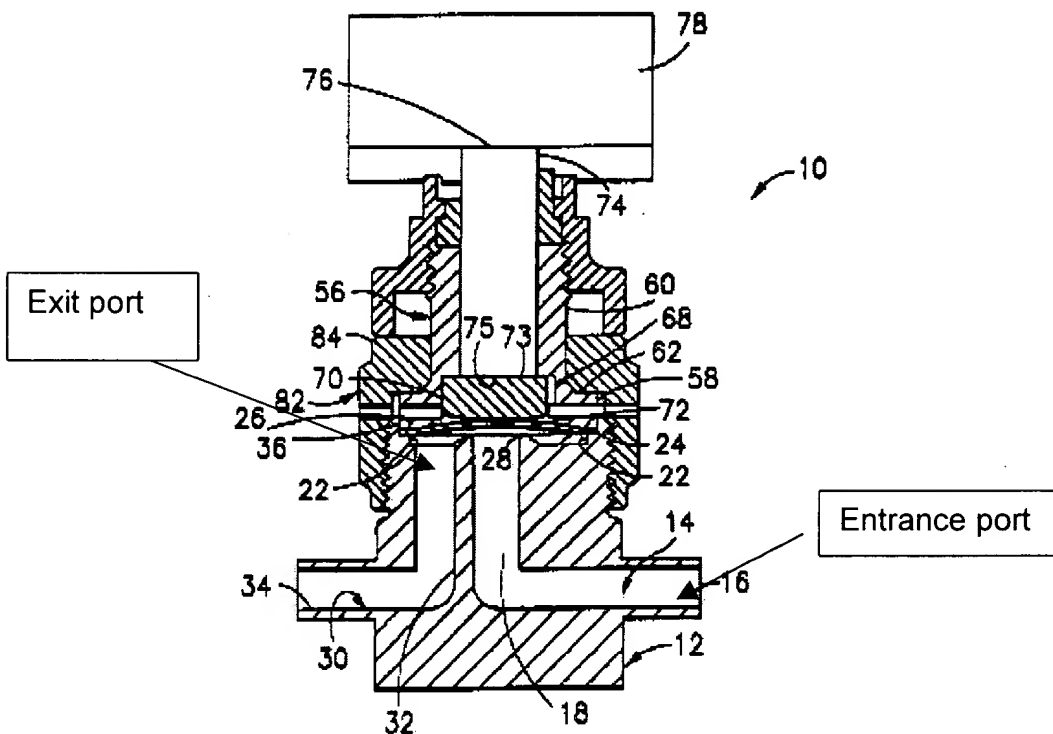
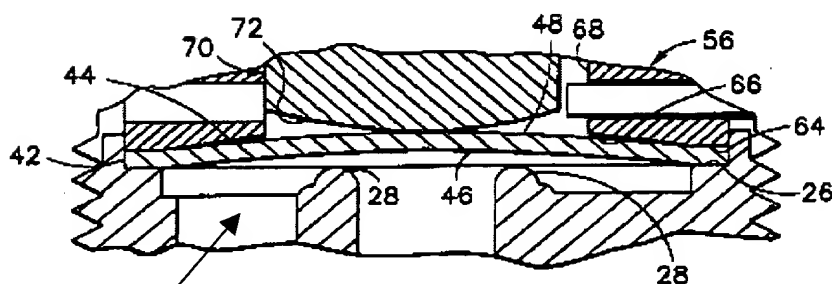
However, Terasawa et al. fails to teach a valve control chamber, a flexible diaphragm, an actuation body, valve control chamber has an entrance port formed on a top wall thereof at a portion where is away from the center portion of the diaphragm and an exit port formed on the top wall, the entrance port is arranged below the exit port, the circumferential portion of the exit port is tapered, the diaphragm includes an annular convex portion and the actuation body is a rod member.

Wu et al. teaches a valve control chamber (fig.1: element 20), a flexible diaphragm (Fig.3: element 40), an actuation body (Fig.1: element 74+78), valve control chamber has an entrance port formed on a top wall thereof at a portion where is away from the center portion of the diaphragm and an exit port formed on the top wall (Fig.1), the entrance port is arranged below the exit port (Fig.1), the circumferential portion of the exit port is tapered (Fig. 2), the diaphragm includes an annular convex portion (Fig. 2: element 48) and the actuation body is a rod member (Fig. 1: element 70+74).

It would have been obvious to one having ordinary skill in the art to have a valve control chamber, a flexible diaphragm, an actuation body the diaphragm includes an annular convex portion as taught by Wu et al in the combined invention of Terasawa et

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al. and Terasawa. The motivation of doing so in order to achieves affective sealing of high-pressure gas (Wu et al., Column 3: line 37-55)

**FIG. 1****FIG. 2**

Exit port is tapered (larger on the top and smaller on the bottom)

Allowable Subject Matter

4. Claims 38-40 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 38 and 39 appear to be allowable over the prior art of record because at least prior art has not been found to anticipate an outer peripheral wall of the groove is tapered such that a diameter of thereof is reduced toward the above.

Claim 40 appears to be allowable over the prior art of record because at least prior art has not been found to anticipate a cross sectional area of the ink flow passage between the exit port and the recording head becomes larger as further from the exit port.

Response to Arguments

Applicant's arguments filed 3/19/2002 have been fully considered but they are not persuasive.

Applicant's argument that Terasawa et al. does not teach the controller controls the capping unit such that the decompressed state of the internal space of the capping unit maintained while the suction pump is driven is not persuasive. Refer to figure 6D and 6E, clearly shows that the cap is closed when the pump is operated.

Therefore, Terasawa meets the limitation of the claim.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ly T TRAN whose telephone number is 703-308-0752. The examiner can normally be reached on M-F (7:30am-5pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on 703-308-3126. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7724 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0967.



May 17, 2002



John Barlow
Supervisory Patent Examiner
Technology Center 2800

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